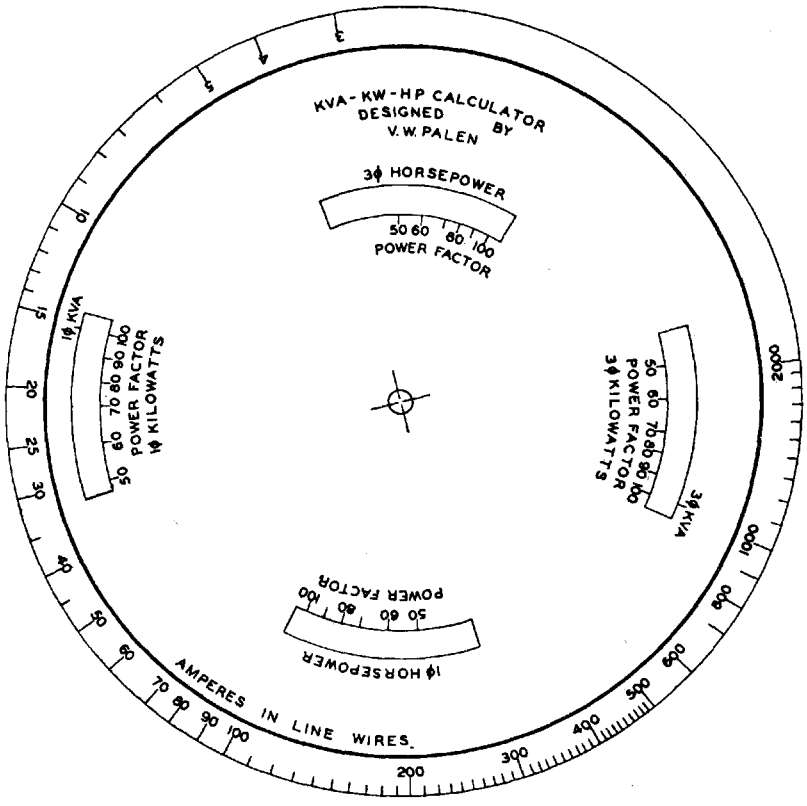
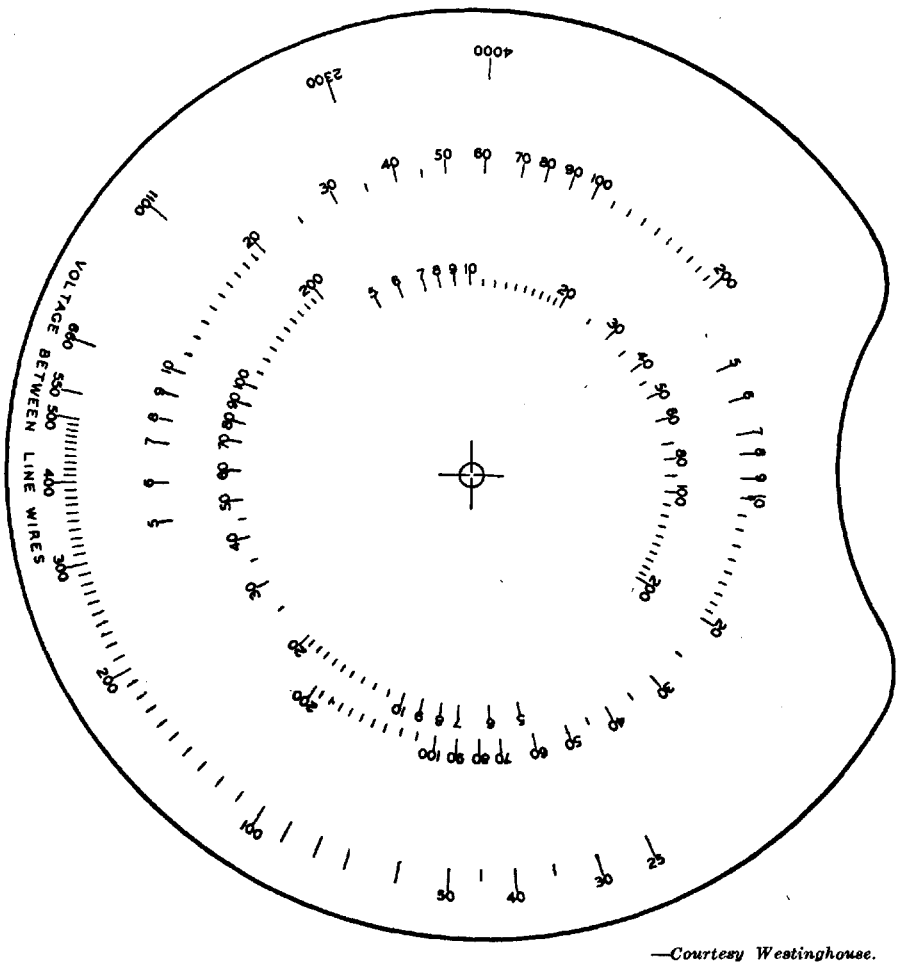




—*Courtesy Westinghouse.*

Make It Yourself

The easily assembled calculator shown here saves much time in determining kva, kw, or hp from known values of amperes and volts. If the size motor to be installed is known, the electrician can determine the amps, and in this manner know what size wire to use for the circuit. Conversely, the calculator indicates what load, in Kva, a transformer is carrying when amps at the transformer terminal are read. The range of the calculator may be extended from 5 to 200 units to one of 50 to 200 units simply by multiplying the values by 10.

The calculator solves single and three phase problems involving the following formulae:

(a) Single phase:

$$\text{Kva} = \frac{\text{Volts} \times \text{Amps}}{1000}$$

$$\text{Kw} = \frac{\text{Volts} \times \text{Amps} \times \text{P. F.}}{1000}$$

$$\text{Hp} = \frac{\text{Volts} \times \text{Amps} \times \text{P. F.}}{746}$$

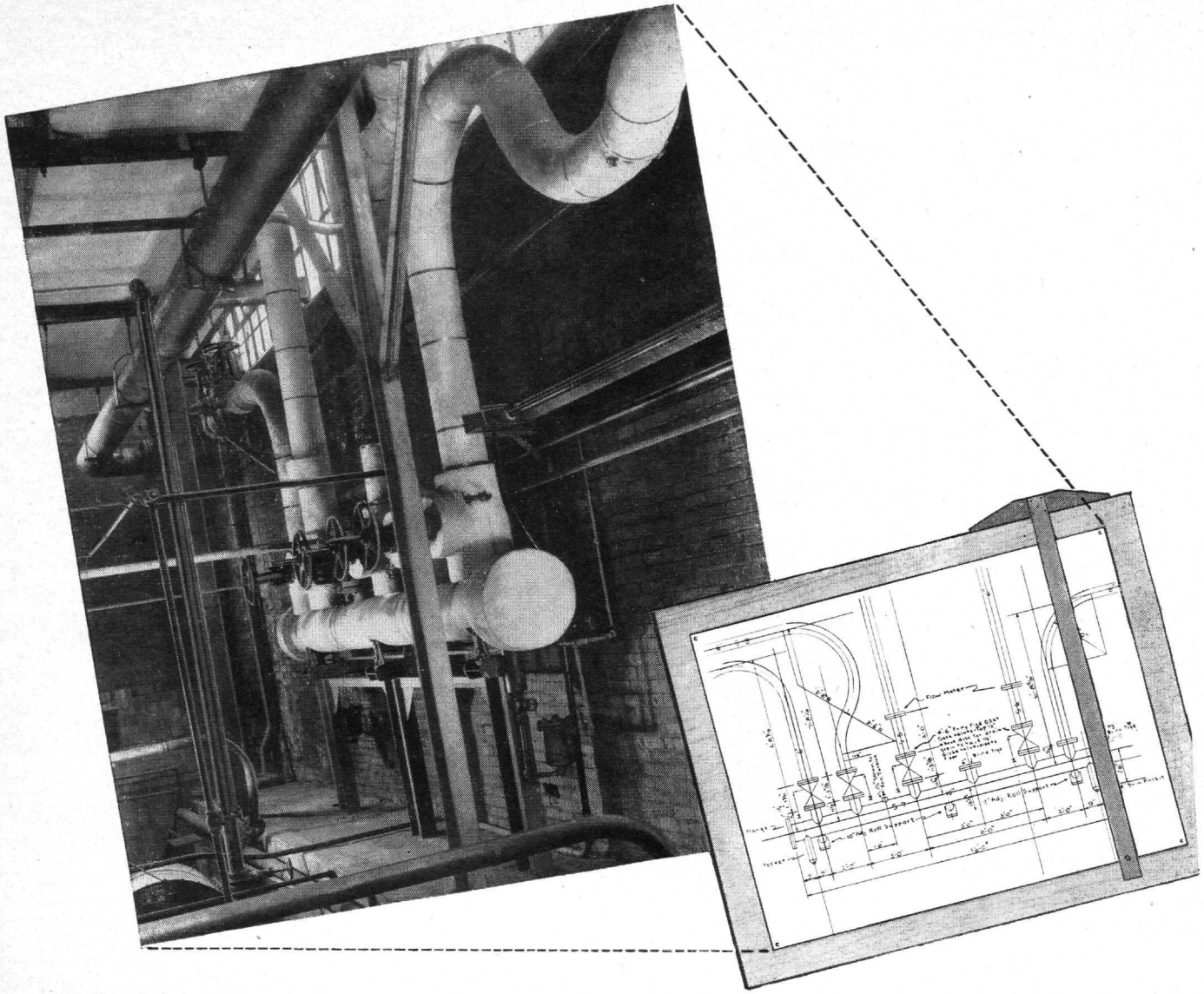
(b) Three phase:

$$\text{Kva} = \frac{\sqrt{3}\ \text{Volts} \times \text{Amps}}{1000}$$

$$\text{Kw} = \frac{\sqrt{3}\ \text{Volts} \times \text{Amps} \times \text{P. F.}}{1000}$$

$$\text{Hp} = \frac{\sqrt{3}\ \text{Volts} \times \text{Amps} \times \text{P. F.}}{746}$$

A calculator may be assembled from the illustration shown simply by cutting out the discs, mounting them on cardboard, and inserting a small brass bolt in the carefully punched center holes. If the bolt is tightened properly, the discs will hold their true centers but turn easily. If a drop of solder is applied to the nut, the assembly will be permanent.



PIPING *is more than a line on a blueprint...*

TRANSLATING a piping blueprint into terms of pipe sizes—kinds of fittings—types of valves will have much to do with determining whether an engineering project is a success or a failure. For almost any project is inconceivable without piping, which controls the flow of air, gas, steam, water, oil or other liquids.

You are probably familiar with the high quality — the precise manufacture — that characterizes valves and fittings made by Crane. You may not know that the Crane line includes equipment for *every need* of *every piping system everywhere.*

Writing "Crane" on a complete piping specification has many advantages to the engineer. First: He knows that every item in the system will come from one source, saving valuable time all down the line from drafting room to final assembly. Second: The project will have a matched piping system—with all parts designed to work together. But, above all, he is assured of the long life and satisfactory operation that come from the exact design and high quality that are a part of every piping item carrying the name Crane.

CRANE CO., 836 S. Michigan Ave., Chicago 5, Ill.

CRANE

VALVES • FITTINGS • PIPE
PLUMBING • HEATING • PUMPS

TO THE UTTERMOST ENDS OF THE EARTH

And so, the roads lead away to the uttermost ends of the earth . . . to the South Seas of Captain Cook and Admiral Halsey . . . to the Orient of the Great Khan and General Chiang Kai-shek . . . to the England of Wellington and Churchill. Along every mile of those roads you will find American boys reading American newspapers and magazines . . . "including all the ads, three times"; and American books . . . "right out of their covers."

It's a long road that has no turning, and turn these roads surely will . . . to bring our victorious warriors home to the most wonderful land they will see in all their travels. The doctrine of the divine right of kings is no longer accepted; and the age of unbridled autocracy—the day of irresponsible and ruthless force—is rightfully condemned. The new generation is coming up, inspired with a broader understanding of the world and of human justice—which will lead the people along the roads of intelligence and four-fold freedom for all.

In town and country you see these happy leaders of the new world—pedalling their bikes along the roads with laughter and eager chatter—exploring the endless wonders of the woods and the fields—winning hard-fought but fair and friendly contests on the sandlots. Brimming with healthy curiosity, they demand to know, these boys and girls: "What? Why? When? Where? Who? What does Kettering say? Compton? What is the air-distance?" Engineers, here's a coming new market that demands your best!

"Sacrificial Corrosion"

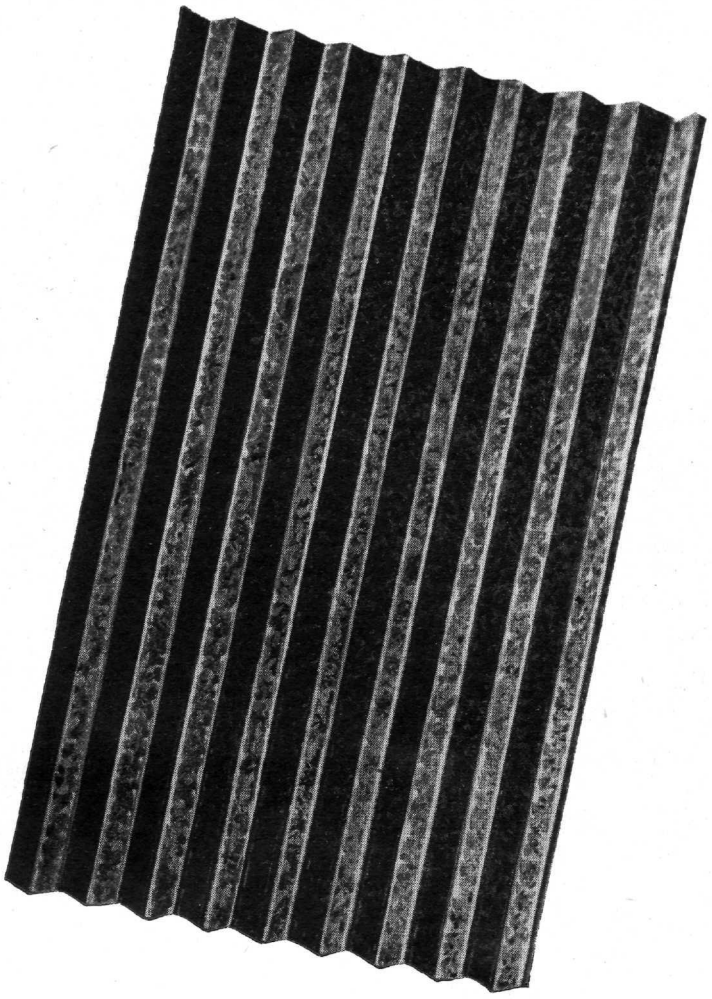
. . . . do you know what it means?

The zinc coating on galvanized sheets or other products protects the iron or steel underneath in two ways: 1, by simple coverage, with a sheath of rust-resistant metal; 2, by electrochemical action or "sacrificial corrosion". The first is clearly understandable, but the second is more complex.

When two metals are put into an acid solution or electrolyte, each will tend to oxidize and to cause an electric current to flow toward the other. The metal more chemically active will oxidize more rapidly and produce the stronger current, and will keep the other metal from oxidizing. This is known as "sacrificial corrosion".

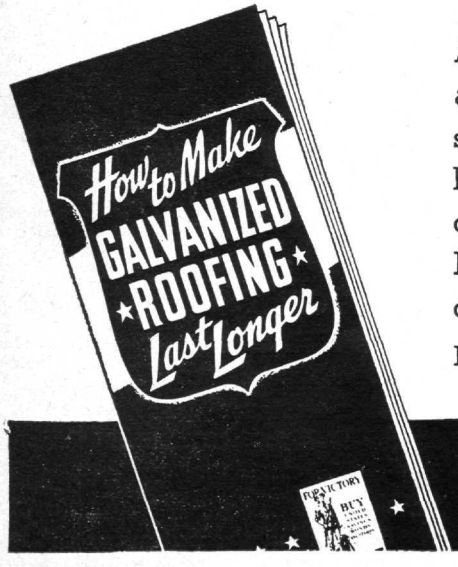
Remember the old "door-bell battery", with the zinc and copper elements? How the zinc gradually oxidized, or corroded away, while the copper was practically unaffected? Here the zinc saved the copper by sacrificial corrosion.

Through an electrochemical action similar to this the zinc on galvanized sheets gives the second kind of protection to the iron or steel base metal: the moisture in the air acts as the electrolyte in microscopic electric cells formed by the zinc and any exposed base metal, and then by "sacrificial corrosion" the zinc keeps the iron or steel from rusting.



ZINC is "by far the Best" Protective Metallic Coating for the Rust-Proofing of Iron and Steel

KEEP YOUR WAR EQUIPMENT FIT AND FIGHTING — FOOD FIGHTS for freedom



All sorts of buildings for the storage and processing of food are covered, roof and sides, with galvanized sheets. Certain steps can be taken which will make this material render better service and last almost indefinitely. These are described in the booklet "How to Make Galvanized Roofing Last Longer", which the Zinc Institute has prepared as part of its contribution to the "Food Fights for Freedom" campaign. It is a booklet worth having. Write for it—it's free.

American Zinc Institute
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